

Atty. Docket No. CPAC 1017-3
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Remarks

Claim 7 is amended herein to correct an editorial error (claim dependency). No new matter is introduced by the amendment, and entry thereof is requested.

Claims 1 - 32 are in the application, of which claims 14 - 32 were withdrawn as being directed to a nonelected invention. Accordingly, claims 1 - 13 are now under consideration.

Reconsideration of the application, as amended, is requested.

The points raised in the Office action will now be addressed.

Section 112 Rejection

Claim 7 was rejected under 35 U.S.C. § 112, ¶ 2, for indefiniteness, the Examiner noting that there was insufficient antecedent basis in the claim for the recitation "land grid array" in the first line of the claim. Claim 7 is amended herein so that it now depends from claim 6, which recites "land grid array", and this rejection can now be withdrawn.

Rejections under 35 U.S.C. § 102(b)

Claim 1 was rejected under 35 U.S.C. § 102 as being anticipated by Massit *et al.* U.S. 5,373,189 ("Massit"). The Examiner asserted:

Massit discloses a multipackage module having a second package (4c) stacked over a first package (4b), each said package comprising a die (10c and 10b, respectively) attached to a substrate (6c and 6b, respectively), the second package substrate (6c) and the first package substrate (6b) being interconnected by wire bonding (13c), wherein the first package comprises a ball grid array package (10b with 11b, Fig. 1 and Cols. 4-5).

This rejection is traversed. Applicant, respectfully, disagrees with the Examiner's reading of Massit, in at least the following respect.

Massit nowhere suggests, much less describes, a ball grid array package. A multipackage module according the invention, in which the first package is a ball grid array package, is described in Applicant's specification (*e.g.*, Paragraphs [0068] - [0069]) with reference to, for example, FIG. 5A. The ball grid array package 400 includes a die attached to a substrate having circuitry in at least one metal layer, in which the circuitry includes bonding sites at the die attach side for electrical interconnection of the die with the substrate and for z-interconnection of the

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second package substrate and, in addition, bonding pads at the side of the substrate opposite the die attach side, for mounting the second level interconnection solder balls 418. Massit says nothing about second-level interconnection, or about any ball grid array on the side of the substrate opposite the die interconnect side.

Referring now to the Examiner's particular reference to Massit Fig. 1: the feature (10a) of Massit is a die (semiconductor chip). An interconnection network or array (8a) covers the upper surface of a support (6a). The die (chip) (10a) is connected to the interconnection network (8a) by means of connections (11a) and (11a'). (Massit Col. 4, lines 15 - 20.) That is, Massit describes "flip chip" interconnection of the chip on a metallization on the substrate ("hybridization of the chip on the substrate" in Massit; *See, e.g.*, Col. 5, lines 1 - 5). This has nothing to do with a ball grid array.

Accordingly, Massit does not describe all the features of Applicant's invention as claimed in claim 1 and, accordingly, the rejection of claim 1 as being anticipated by Massit should be withdrawn.

Claims 1 - 7 were rejected under 35 U.S.C. §102 as being anticipated by Takiar *et al.* U.S. 5,495,398 ("Takiar"). The Examiner asserted:

Takiar discloses a multipackage module having a second package [(136 and 142, Fig. 7), (216 and 214, Fig. 11), (264 and 262, Fig. 14)] stacked over a first package [(138 and 140, Fig. 7), (212 and 218, Fig. 11), (264 and 260, Fig. 14)], each said package comprising a die [(140 and 136, Fig. 7), (216 and 212, Fig. 11), (264 and 260, Fig. 14)] attached to a substrate [(138 and 142, Fig. 7), (214 and 218, Fig. 11), (262 and 268, Fig. 14)], the second package substrate and the first package substrate being interconnected by wire bonding, wherein the first package comprises a ball grid array package (Figs. 1, 7, 11, 14 and Col. 4, lines: 35-65 and Col. 7, lines: 22-40 and Col. 9).

This rejection is traversed. Applicant, respectfully, disagrees with the Examiner's reading of Takiar, in at least the following respect.

Takiar nowhere suggests, much less describes, a ball grid array package. As explained above, a multipackage module according to the invention, in which the first package is a ball grid array package, is described in Applicant's specification (*e.g.*, Paragraphs [0068] - [0069]) with reference to, for example, FIG. 5A. The ball grid array package 400 includes a die attached to a substrate having circuitry in at least one metal layer, in which the circuitry includes bonding sites

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at the die attach side for electrical interconnection of the die with the substrate and for z-interconnection of the second package substrate and, in addition, bonding pads at the side of the substrate opposite the die attach side, for mounting the second level interconnection solder balls 418. Takiar says nothing about second-level interconnection, or about any ball grid array on the side of the substrate opposite the die interconnect side.

Referring now to the Examiner's particular reference to Takiar Figs. 1, 7, 11 and 14; and Col. 4, lines 35 - 65, Col. 7, lines 22 - 40 and Col. 9: These Figs. (and associated text) show various packages having die mounted on a "carrier", which includes leads by which interconnection of the package is made (e.g., leads (44), (46) in Takiar Fig. 1). This has nothing to do with a ball grid array.

Accordingly, Takiar does not describe all the features of Applicant's invention as claimed in claim 1 and, accordingly, the rejection of claim 1 as being anticipated by Takiar should be withdrawn.

Rejections under 35 U.S.C. § 103(a)

Claims 8 - 13 were rejected under 35 U.S.C. §103(a) for obviousness over Takiar in view of Chen *et al.* U.S. 6,472,741 ("Chen").

Takiar was applied as in the rejections under 35 U.S.C. § 102(b). The Examiner acknowledged that Takiar does not describe a heat spreader having a generally planar upper surface exposed at the top of the module. Chen is relied upon as teaching a heat spreader (claims 8 - 10) which, the Examiner argues, one could "realize ... as an electromagnetic shield ... since it is composed of metal."

This rejection is traversed. In view of the lack of any suggestion or teaching in Takiar of second package stacked over a first ball grid array package, it is not understood how any combination of Takiar with Chen makes Applicant's invention as claimed.

Accordingly Applicant's invention as claimed is not taught or suggested by any combination of the cited patents and, accordingly, the rejections for obviousness should be withdrawn.

In view of the foregoing, all the claims now in the application are believed to be in condition for allowance, and action to that effect is respectfully requested

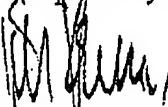
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This Response is being filed within the second month following the three months' shortened statutory period set by the Examiner for response to the Office action and, accordingly, it is accompanied by a Petition for two months' extension of time and a fee or fee authorization therefor. In the event the Examiner may determine that additional fee[s] may be required in connection with the filing of this paper, petition is hereby made therefor, and the Commissioner is authorized to charge any additional fee (or to credit any overpayment) to Deposit Account No. 50-0869 (CPAC 1017-3).

If the Examiner determines that a conference would facilitate prosecution of this application, the Examiner is invited to telephone Applicants' representative, undersigned, at the telephone number set out below.

Respectfully submitted,



Bill Kennedy
Reg. No. 33,407

Reg. No. 33,407

Haynes Beffel & Wolfeld LLP
P.O. Box 366
Half Moon Bay, CA 94019
Telephone: (650) 712-0340